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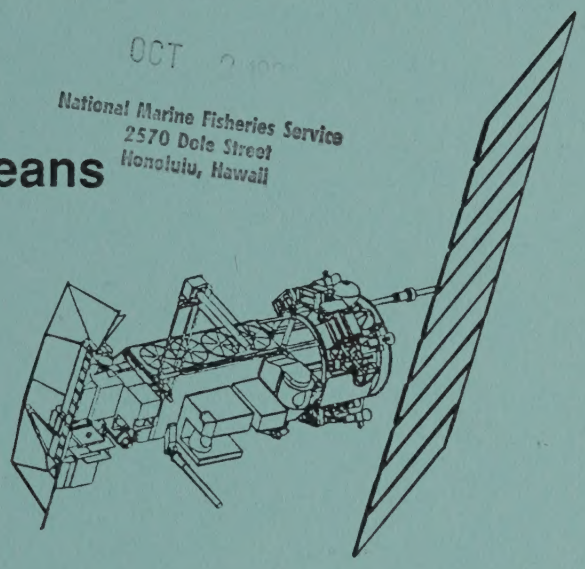

August 1989

U.S. DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
National Environmental, Satellite, Data, and Information Service
National Oceanographic Data Center

COASTAL OCEANS

August 1989

The present condition of our coastal environments has prompted renewed initiative towards preventing further deterioration and pollution. As an agency, with major responsibility for the Nation's coastal zone, NOAA has established a Coastal Ocean Program combining research efforts from its various branches. With the cooperation of other government and state agencies, the goal is to be able to **predict** environmental changes resulting from: (1) human impact such as pollution, alteration, fishing; and (2) natural physical hazards such as storms, erosion and sea-level changes.

Prediction and modeling are dependent upon extensive baseline studies. This bibliography consists of references to such studies and to current modeling research. Included are general interest articles provided for background information.

It is not intended to be a comprehensive literature review, but rather to be a selective compilation of current citations retrieved from relevant databases and from the NOAA Central Library collection. The databases are: Aquatic Sciences & Fisheries (ASFA); National Technical Information Service (NTIS); Geological Reference File (GEOREF); Meteorological & Geoastrophysical Abstracts (MGA). Abstracts are included when available.

The bibliography is divided into: (1) Comprehensive works; (2) Coastal zone; (3) Living resources ; and (4) Pollution.

Questions about this material may be addressed to Reference Desk, NOAA Central Library, 6009 Executive Blvd., Rockville, MD 20852, or call (301) 443-8330.

I. Comprehensive Works

Boston Harbor and Massachusetts Bay: Issues, resources, status and management. NOAA Estuary-of-the-Month seminar series No. 4
Brown, Betsy.
Washington, D.C.: NOAA, Estuarine Programs Office, 131p., 1987.
NTIS #: PB88175781XSP

Abstract: The report contains papers presented at a seminar on Boston Harbor and Massachusetts Bay held on June 13, 1985, with the objective of bringing to the public attention the important research and management issues in the Bay. An historical overview is given, followed by examinations of sewage management, fisheries, chemical considerations in the habitat, hepatic histopathology of winter flounder, and multiple uses and management.

Marine Environmental Assessment: Southeastern U.S., 1986 Annual Summary Climate impact assessment.
Dowgiallo, M. J. ; Sheifer, I. C.; Everdale, F. G.; Pechmann, K. B.; Predoehl M. C.
Washington, D.C.: NOAA, NESDIS, 144p, Sep. 1987.
NTIS #: PB88145321XSP

Abstract: The Southeastern U.S. assessment which is a prototype summary covering the calender year 1986 includes information on weather, oceanography, fisheries, recreation, transportation, and pollution. The assessment and Information Services Center has produced assessments for other areas along U.S. coasts including Chesapeake Bay, the Gulf of Mexico, Puget Sound, and San Francisco Bay. The assessment focuses on the effects of environmental events (meteorology, oceanography) on the marine resources of the region. Impacts of short- and long-term processes and events are identified and quantified, where possible, in the fisheries, recreation, and transportation resource sectors.

A Citizen's guide to coastal water resources management.
Kennedy, J.
Raleigh, NC: The Program, 1988.

Salt pond watchers: Rhode Island's experiment in citizen monitoring. Lee, V.; Kullberg, P.
10th. Natl. Conf. Estuar. and Coast. Management: Tools of the Trade, New Orleans, LA (USA), Oct. 12-15, 1986. pp. 353-358, 1987.

Abstract: It is generally accepted that well conceived long-term monitoring programs are needed to provide time series data sets for coastal ecosystems. In these times of diminishing budgets, the use of trained and organized volunteers in simple monitoring programs may be a way to obtain scientifically useful long-term data in a cost-effective manner for many of our nation's estuaries. Only a few states are embarked on monitoring coastal waters, among them is Rhode Island's Salt Pond Watching Program.

Coastal Zone '89. The Sixth Symposium on Coastal and Ocean
Management. July 11-14, 1989, Charleston, SC.
Magoon, O. T., et al.
New York: American Society of Civil Engineers, 1989.

Oceans '86. SCIENCE-ENGINEERING-ADVENTURE. Proceedings, Vol. 3, Monitoring Strategies Symposium. Washington, D.C., September 23-25, 1986. Sponsored by the Marine Technology Society and IEEE.
New York, NY: The Institute of Electrical and Electronics Engineers; Marine Technology Society, 1986.

Oceans '88. A Partnership of Marine Interests. Proceedings, 4 vol. Baltimore, MD, October 31-November 2, 1988. Sponsored by the Marine Technology Society and IEEE.
New York, NY: The Institute of Electrical and Electronics Engineers; Marine Technology Society, 1988.

Bering, Chukchi, and Beaufort Seas coastal and ocean zones strategic assessment data atlas.
National Oceanic and Atmospheric Administration.
Rockville, MD: NOAA, NOS, Strategic Assessments Branch, 1989.

Coastal Ocean News. Bimonthly Newsletter of the Office of Oceanography and Marine Assessment.
National Oceanic and Atmospheric Administration.
Rockville, MD: NOAA, NOS, OMA, 1988-.

Gulf of Mexico: coastal and ocean zones data atlas.
National Oceanic and Atmospheric Administration.
Rockville, MD: NOAA, Strategic Assessments Branch, 1985.
For sale by GPO.

National estuarine inventory data atlas. Vol. 1: Physical and hydrologic characteristics.
National Oceanic and Atmospheric Administration.
Rockville, MD: NOAA, NOS, Strategic Assessments Branch, 1985.

National estuarine inventory data atlas. Vol. 2: Land use characteristics.
National Oceanic and Atmospheric Administration.
Rockville, MD: NOAA, NOS, Strategic Assessments Branch, 1987.

National estuarine inventory data atlas. Vol. 3: Coastal Wetlands of New England.
National Oceanic and Atmospheric Administration.
Rockville, MD: NOAA, NOS, Strategic Assessments Branch, 1989.

National estuarine inventory data atlas. Vol. 4: Public Recreation Facilities in Coastal Areas.
National Oceanic and Atmospheric Administration.
Rockville, MD: NOAA, NOS, Strategic Assessments Branch, 1989. (GPO)

Strategic Assessment of Near Coastal Waters: Northeast Case Study. Chapter 3 - Susceptibility and Concentration Status of Northeast Estuaries to Nutrient Discharges.
NOAA/EPA Team on Near Coastal Waters.
Rockville, MD: NOAA, NOS, Strategic Assessments Branch; EPA, Environmental Results Branch, July 1988.

NOAA's coastal ocean program: An integrated systems approach to problems confronting our Nation's coastal waters.
National Oceanic and Atmospheric Administration.
Rockville, MD: NOAA, 1989.

Long Island Sound: Issues, Resources, Status and Management. NOAA Estuary-of-the-Month Seminar Series No. 3.
Gibson, V. R.; Connor, M. S.
National Oceanic and Atmospheric Administration.
Washington, D.C.: NOAA, Estuarine Programs Office, 151p., 1987.
NTIS #: PB88175773XSP

Abstract: The report contains papers presented at a seminar on Long Island Sound held on May 10, 1985 with the objective to bring to the public attention the important research and management issues in the Sound. The 10 papers address the natural, biological, chemical, geological, and physical processes that characterize Long Island Sound; the status of the Sound's living marine resources; the effects of humankind on the Sound environment and living resources; and management problems.

Delaware Bay: Issues, Resources, Status and Management. NOAA Estuary-of-the-Month Seminar Series No. 2.
Goodrich, David M.
National Oceanic and Atmospheric Administration.
Washington, D.C.: NOAA, Estuarine Programs Office, 147p., Dec. 1986.
NTIS #: PB88175765XSP

Abstract: The report contains papers presented at a seminar on Delaware Bay held on March 1, 1985, with the objective of bringing public attention to the important research and management issues in the Bay. An overview is given by senior scientific investigators that includes explanations of impacts of human development; geological history and setting; physical and chemical oceanography, biology; and real-time circulation modeling of the Bay; followed by an examination of management issues by leaders of planning and regulatory agencies involved in the Bay.

Narragansett Bay. Issues, Resources, Status and Management. NOAA Estuary-of-the-Month Seminar Series No. 1.
National Oceanic and Atmospheric Administration.
Washington, D.C.:NOAA, Estuarine Programs Office; EPA, 176p., 1987.
NTIS #: PB88175757XSP

Abstract: The report contains papers presented at a seminar on Narragansett Bay on January 28, 1985 with the objective of bringing to the public attention the important research and management issues in the Bay. The many issues concerning the health and value of the Bay are considered dealing with subjects ranging from waste crankcase oil disposal to sociological concerns. First an overview is given then explanations of Bay economics, pollution inputs, circulation dynamics, and management issues.

Galveston Bay: Issues, Resources, Status and Management. NOAA Estuary-of-the-Month Seminar Series No. 13.
National Oceanic and Atmospheric Administration.
Washington, D.C.: NOAA, Estuarine Programs Office; EPA, 114p., 1989.

Tampa and Sarasota Bays: Issues, Resources, Status and Management. NOAA Estuary-of-the-Month Seminar No. 11.
National Oceanic and Atmospheric Administration.
Washington, D.C.: NOAA, Estuarine Programs Office, 215p., 1989.

Puget Sound: Issues, Resources, Status and Management. NOAA Estuary-of-the-Month Seminar Series No. 8.
National Oceanic and Atmospheric Administration.
Washington, D.C.: NOAA, Estuarine Programs Office, 161p., 1988

Lake Erie Estuarine Systems: Issues, Resources, Status and Management. NOAA Seminar-of-the-Month Series No. 14.
National Oceanic and Atmospheric Administration.
Washington, D.C.: NOAA, Estuarine Programs Office, 290p., 1989.

Charleston Harbor: Issues, Resources, Status and Management. NOAA Seminar-of-the-Month Series No. 16.
National Oceanic and Atmospheric Administration.
Washington, D.C.: NOAA, Estuarine Programs Office, 62p., 1989.

San Francisco Bay: Issues, Resources, Status and Management. NOAA Estuary-or-the-Month Series, No. 6.
National Oceanic and Atmospheric Administration.
Washington, D.C.: NOAA, Estuarine Programs Office, 159p., 1987.
NTIS #: PB88175799XSP

Abstract: The report contains papers presented at a seminar on San Francisco Bay held on November 22, 1985, with the objective of bringing to the public attention the important research and management issues in the Bay. An overview of the Bay is given by senior scientific investigators that includes explanations of contaminants, nutrients, and water diversion on the Bay; followed by an examination of management issues by leaders of planning and regulatory agencies involved in the Bay.

Coastal Monitoring: Evaluation of Monitoring Methods in Narragansett Bay, Long Island Sound and New York Bight, and a General Monitoring Strategy.
Phelps, D. K.; Katz, C. H.; Scott, K. J.; Reynolds, B. H. Environmental Research Lab., Narragansett, RI.
New Approaches to Monitoring Aquatic Ecosystems, American Society for Testing and Materials, Special Technical Publication 940, pp.

107-124, 1987.
NTIS #: PB88107164XSP

Abstract: The paper evaluates biological, chemical, and physical monitoring methods and presents a research strategy for coastal monitoring. The purpose of the strategy is to provide a conceptual model for detecting contaminant-induced perturbations of marine systems. The proposed strategy represents a shift in emphasis from analysis of chemical concentrations to an initial biological examination of the effects of contaminants on marine organisms. Evidence of adverse biological effects obtained in this hierarchical strategy would result in the application of chemical and physical techniques to identify the types and sources of contaminants.

Eastern United States: coastal and ocean zones data atlas.
Ray, G. Carleton, et al.
Washington, D.C.: Council of Environmental Quality; NOAA, Office of Coastal Zone Management, 1980.

Greenhouse effect, sea level rise, and coastal wetlands.
Titus, J. G. (Ed.)
Washington, D.C.: U.S. Environmental Protection Agency, Office of Policy Analysis, 156p., July 1988.

Abstract: To further society's understanding of how to rationally respond to the possibility of a substantial rise in level, EPA has undertaken assessments of the impacts of sea level rise on economic development, beach erosion control strategies, salinity of estuaries and aquifers, and coastal drainage and sewage systems. Those studies have generally found that even a one-foot rise in a sea level has important implications for the planning and design of coastal facilities. This report examines the potential impacts of sea level on coastal wetlands in the United States. Coastal marshes and swamps are generally within a few feet of sea level, and hence could be lost if seal level rises significantly. Although new wetlands could form where new areas are flooded, this cannot happen where the land adjacent to today's wetlands is developed and protected from the rising sea. Once built, neighborhoods can be expected to last a century or longer. Therefore, todays coastal development could limit the ability of coastal wetlands to survive sea level in the next century. Chapter 1 provides an overview of the greenhouse effect, projections of future sea level rise, the basis for expecting significant impacts on coastal wetlands, and possible responses. Chapters 2 and 3 present case studies of the potential impacts on wetlands around Charleston, South Carolina, and Long Beach Island, New Jersey, based on field surveys. Chapter 4 presents a first attempt to estimate the nationwide impact, based on topographic maps. Finally, Chapter 5 describes measures that wetland protection officials can take today. This report neither examines the impact of sea level rise on specific federal programs nor recommends specific policy changes.

Ocean System Studies. NOAA/OAR Research Strategy I: The Ocean System - Prediction and Resources.
University Corporation for Atmospheric Research (Boulder, CO) and Office of Oceanic and Atmospheric Research, National Oceanic and Atmospheric Administration.
Rockville, MD: National Oceanic and Atmospheric Administration, 1988.

Estuarine variability. (Proceedings of the Eighth Biennial International Estuarine Research Conference, University of New Hampshire, Durham, July 28 - August 2, 1985).
Wolfe, D. A.(Ed.)
Orlando, FL: Academic Press, 509p., 1986

Abstract: Individual contributions are catalogued separately.

Marine Environmental Assessment: Southeastern U.S., 1986 Annual Summary Climate impact assessment.
Dowgiallo, M. J. ;I. C. Sheifer;F. G. Everdale;K. B. Pechmann; Predoehl, M. C., 144p., Sep. 1987.

Abstract: The Southeastern U.S. assessment which is a prototype summary covering the calender year 1986 includes information on weather, oceanography, fisheries, recreation, transportation, and pollution. The assessment and Information Services Center has produced assessments for other areas along U.S. coasts including Chesapeake Bay, the Gulf of Mexico, Puget Sound, and San Francisco Bay. The assessment focuses on the effects of environmental events (meteorology, oceanography) on the marine resources of the region. Impacts of short- and long-term processes and events are identified and quantified, where possible, in the fisheries, recreation, and transportation resource sectors.

II. Coastal Zone

The role of oceanic fluxes and initial data in the numerical prediction of an intense coastal storm. M-6 Symposium on the Role of Air-Sea Interaction in Mesoscale Development (at) IAMAP/IAPSO Joint Assembly Honolulu, HI (USA) 5-16 Aug 1985.
Atlas, R.
DYN. ATMOS. OCEANS, vol. 10, no. 4, pp. 359-388, 1987.

Abstract: On 18-19 February 1979, an intense cyclone developed along the east coast of the United States and produced heavy snowfall accumulations from Virginia to southeast New York. A series of forecast experiments was conducted to assess the accuracy of the GLA model's prediction of this storm and the importance of oceanic heat and moisture fluxes and initial data to the cyclogenesis. Detailed examination of these forecasts shows that diabatic heating resulting from oceanic fluxes increased low-level baroclinicity, decreased static stability and significantly contributed both to the generation of low-level cyclonic vorticity, and to the intensification and slow rate of movement of an upper-level ridge over the western Atlantic. An examination of the NMC and GLA analyses indicated that a weaker representation of the upper-level trough in the interpolated NMC analysis was primarily responsible for the resulting forecast differences.

Galveston Island - a changing environment.
Benton, A. R.,Jr. ; Clark, C. A.; Snell, W. W..
Rep. Tex. A and M Univ. Sea Grant Program, TAMU; College Station, TX (USA). Jan. 1980.

Abstract: The final report of a one-year remote sensing study of baseline conditions at Galveston Island, Texas is presented. The purpose of the project was to provide the City of Galveston with environmental documentation needed to guide the future development of the

island. Commercial developers had been building on the marshes and dunes of the southwest half of the island. Strong opposition had been developing from environmentalists and from fishermen who viewed the propsect of continued construction as destructive to that environmentally sensitive area. It was found that two distinct barrier island regimes are now being threatened by natural forces and by currently unrestricted human activities. The wetlands system, which includes all of the areas bayward of the dune crest, is being both diminished and stressed by overgrazing and by construction. The beach areas, running from dune top to the shoreline, are under the combined attack of coastal erosion, vehicular traffic and beachfront construction.

Absolute Sea Level Pilot Regional Networks Project: Progress Report: Draft.
Carter, W. E.; Diamante, J. M.; Sherer, W.
National Oceanic and Atmospheric Administration, 113p., Jan 1988.
NTIS #: DE89005261/XAB

Abstract: One of the generally acknowledged key indices of climate change is sea level, and long-term trends in global sea level are critical factors in understanding long-term changes in climate. The importance of global sea level observations and research was recently underscored by the US WOCE Science Steering Committee. Large-scale melting of polar ice and thermal expansion of ocean water due to any global warming trend is expected to be reflected eventually in sea level data. However, whether the reported rise in observed global sea level can be properly related to a postulated global warming trend, perhaps due to observed increases in atmospheric carbon dioxide and trace gases cannot be rigorously answered at the present time. One major problem is in the quality and nature of the existing sea levels measurements networks. These are inadequate in terms of extracting certain systematic biases from long-term sea level trends. Most significant of these biases is the vertical motion of the coastal land areas to which the sea level measurements are referenced. However, the technical basis for removing this error source now exists in the form of the modern geodetic positioning systems.

Coastal Environments: An Introduction to the Physical and Cultural Systems of Coastlines.
Carter, R. W. G.
New York: Academic Press, 617p., 1988.

Saving Louisiana's coastal wetlands. The need for a long-term plan for action.
Chambers, D.; Titus, J. G.
Washington, D.C.: U. S. Environmental Protection Agency, 109p., April 1987. NTIS #: PB88145230XSP

Abstract: America's largest wetland community is losing its marshes and swamps to the Gulf of Mexico. The wetlands of coastal Louisiana are being converted to open ocean at the rate of fifty square miles a year, largely as a result of maintaining shipping lanes, the dredging of canals, flood control levees, and the withdrawal of oil and gas. To date, no comprehensive plan has been developed to solve the wetland problem. The report provides an overview of causes to the problem, describes possible solutions, and finally outlines a study to evaluate comprehensive solutions to the Louisiana wetland loss.

Aircraft MSS data registration and vegetation classification for wetland change detection.
Christensen, E. J.; Jensen, J. R.; Ramsey, E. W.; Mackey, H. E.,Jr INT. J. REMOTE SENS, vol. 9, no. 1, pp. 23-38, 1988.

Abstract: Portions of the Savannah River floodplain swamp were evaluated for vegetation change using high resolution (5 multiplied by 6 m) aircraft multispectral scanner (MSS) data. Image distortion from aircraft movement prevented precise image-to-image registration in some areas. However, when small scenes were used (200-250 ha), a first-order linear transformation provided registration accuracies of less than or equal to one pixel. A larger area was registered using a piecewise linear method. Five major wetland classes were identified and evaluated for change. Phenological differences and the variable distribution of vegetation limited wetland type discrimination. Using unsupervised methods and ground-collected vegetation data, overall classification accuracies ranged from 84 per cent to 87 per cent for each scene. Results suggest that high-resolution aircraft MSS data can be precisely registered, if small areas are used, and that wetland vegetation change can be accurately detected and monitored.

Sources of Coastal Engineering Information. Final rept.
Chu, Y.; Lund R. B.; Camfield, F. E.
Coastal Engineering Research Center, Vicksburg, MS CERC-TR-87-1, 244p., Jan 87. NTIS #: ADA1805514XSP

Abstract: Coastal engineering is a specialized branch of the engineering profession which requires the knowledge of many physical sciences and engineering disciplines in the practice. Typical coastal projects involve planning, design, and/or construction for harbor developments; navigation channel improvements; coastal inlet stabilization; coastal flooding and shoreline erosion protection; and beach restorations and nourishments. Coastal engineering data or information covered by this report include: (a) meteorology and climatology; (b) water levels; (c) winds and storms; (d) waves and currents; (e) ice information; (f) littoral transport and shoreline erosion; (g) coastal egology; (h) topography, hydrography, and bathymetry; and (i) earthquakes and tsunamis.

Impact of Hurricanes on Pinellas County, Florida 1985. Technical paper. Davis, R. A.; Andronaco, M.
Florida Sea Grant Coll., Gainesville TP-51, 57p., May 1987.

Abstract: Three hurricanes had impact on the west-central coast of Florida during the fall of 1985; Elena, Juan and Kate. Although eac caused damage, Elena was by far the most significant. It caused considerable damage to coastal structures, buildings and necessitate evacuation of virtually the entire coastal community of Pinellas County. Preparation and the modest energy from Elena limited th financial loss and injury and prevented any deaths in this area.

OTEC Physical and Climatic Environmental Impacts.
Ditmars, J. D.; Paddock, R. A. Argonne Natl. Lab.
OTEC conference, Washington, DC, USA, 19 Jun 1979. 10p., 1979.
NTIS #: CONF-79 0631-11

Abstract: Assessment of Ocean Thermal Energy Conversion (OTEC) environmental impacts and resource utilization requires an understandin of the physical processes underlying the interactions between an OTEC plant or plants and the ocean. An overview of the US Departmer of Energy program for the development and application of analyses and models for the prediction of the physical aspects of OTEC impact is presented. Predictive tools are necessary to address problems at different site areas, scales of OTEC deployment, and time horizons The effects of intake/discharge designs and of ambient ocean conditions on recirculation and near-field effluent plume behavior ha

been investigated by means of physical models. Further study of the intake flow fields may be necessary to make estimates of intake impingement and entrainment effects. Mathematical analysis of intermediate-field mixing of plant effluents has shown that effluent plumes may have vertical dimensions on the order of meters and lateral dimensions on the order of kilometers. Models of oceanic regional and island coastal circulation are required to investigate far-field effects on the scale of tens of kilometers. Basin-wide resource renewal and physical environmental effects are being studied by means of a numerical model of the Gulf of Mexico with detailed vertical resolution. Concerns regarding climatic impacts presently are focused on atmospheric CO sub 2 loading and modification of air--sea heat exchange processes due to OTEC operation. (ERA citation 04:052883).

A forecast procedure for coastal floods in Alaska.
Fathauer, T. F.
National Oceanic and Atmospheric Administration.
Anchorage, AK: NOAA, NWS, 27p., June 1978.

Generalized monitoring of SEASCAPE (trade name) installation at Cape Hatteras Lighthouse, North Carolina. Final Report.
Forman, J. W.
Vicksburg, MS: Coastal Engineering Research Center, 76p., 1986.
NTIS #: ADA1673391XSP
Abstract: This report documents a monitoring program to assess the effectiveness of SEASCAPE, an artificial seaweed, for temporarily stabilizing the shoreline fronting the lighthouse at Cape Hatteras, North Carolina. The monitoring program consisted of aerial photography, beach profile surveys, reconnaissance dives, and ground photography. Although consideration accretion occurred during the monitoring period, the accumulation was the result of a general build up of the beach which averaged 25 ft over the 6.1-mile study area. There was no conclusive evidence to link the buidup to the 5,000 ft of SEASCAPE which was deployed in October and November, 1982. Moreover, it was not possible to attribute burial of the SEASCAPE to the action of the artificial seaweed versus burial by normal wave-driven migration of sand. The units themselves were found to deteriorate and to fragment with whole units and parts of units washing up on the beach.

The National Estuarine Research Reserve System: Past activities and future directions. 10. National Conference. Estuarine and Coastal Management: Tools of the Trade New Orleans, LA (USA) 12-15 Oct 1986.
Foster, N., p. 761, 1987.

Abstract: The National Estuarine Research Reserve System (formerly National Estuarine Sanctuary Program) was established in 1986 with legislation that reauthorized the Coastal Zone Management Act of 1972 (CZMA). The mission of the System is the establishment and management, through an equally-shared federal-state cooperative effort, of a national system of estuarine research reserves representative of biogeographical regions and estuarine types in the United States. National estuarine research reserves are established to provide opportunities for long-term research, education and interpretation. Scientific and educational programs are particularly focused on the development of information for improved coastal management decisionmaking.

National marine sanctuaries -- saving offshore ecosystems.
Foster, N.
Sea Technology, vol. 27, no. 11, pp. 25-29, 1986.

Abstract: The current list of sanctuaries consists of: Key Largo National Marine Sanctuary, Looe Key National Marine Sanctuary, Gay's Reef National Marine Sanctuary, Channel Islands National Marine Sanctuary, Point Reyes-Farallon Islands National Marine Sanctuary, the Monitor National Marine Sanctuary, Fagatele Bay National Marine Sanctuary, Cordell Bank, Flower Garden Banks, and Norfolk Canyon. The seven existing sites were designated pursuant to Title III of the Marine Protection, Research and Sanctuaries Act of 1972, 16 U.S.C. 1431 et seq. The act represents a significant piece of legislation since it provided the first opportunity to designate and manage discrete offshore areas as ecosystems rather than managing individual marine resources such as mammals or fish.

A Nested Numerical Tidal Model of the Southern New England Bight. Final Report.
Gordon, R. B.; Spaulding, M. L. Rhode Island Univ, Kingston, RI, 62p., Jan. 1979. NTIS #: N79-14698/1

Abstract: Efforts were focused on the development and application of a three-dimensional numerical model for predicting pollutant and sediment transport in estuarine and coastal environments. To successfully apply the pollutant and sediment transport model to Rhode Island coastal waters, it was determined that the flow field in this region had to be better described through the use of existing numerical circulation models. A nested, barotropic numerical tidal model was applied to the southern New England Bight (Long Island, Block Island, Rhode Island Sounds, Buzzards Bay, and the shelf south of Block Island). Forward time and centered spatial differences were employed with the bottom friction term evaluated at both time levels. Using existing tide records on the New England shelf, adequate information was available to specify the tide height boundary condition further out on the shelf. Preliminary results are within the accuracy of the National Ocean Survey tide table data.

Man's effects on estuarine shorelines; New York Harbor, a case study San Francisco Bay; use and protection; symposium convened during the 61st annual meeting of the Pacific Division of the American Association for the Advancement of Science.
Gross, M. G.; Kockelman, W. J.(EDITOR); Conomosa, T. J.(EDITOR); Leviton, A. E.(EDITOR) National Science Foundation; Calif. Acad. Sciences; U. S. Geological Surv., pp. 9-15, 1982.

Assessment model for estuarine circulation and salinity.
Hess, K. W.
National Oceanic and Atmospheric Administration.
Washington, D.C.: NOAA, NESDIS, 39p., 1985.

Predicted winds for Chesapeake Bay from LFM and observational data. Hess, K. W.
National Oceanic and Atmospheric Administration.
Washington, D.C.: NOAA, NESDIS, 12p., 1987.

A sectorized stretched gridmesh for modeling San Francisco Bay and shelf circulation.
Hess, K. W.
National Oceanic and Atmospheric Administration.

Washington, D.C.: NOAA, NESDIS, 26p., 1987.

Use of mineralogical and hydraulic properties of sediments to identify environmental ''impact'' of construction activity on adjacent wetland areas; a case history. New horizons in engineering geology.
Isphording, W. C.; Imsand, F. D.; Kent, M. (EDITOR)
Annual Meeting - Association of Engineering Geologists 24, pp. 41-42, 1981.

Inland wetland change detection using aircraft MSS data.
Jensen, J. R.; Ramsey, E. W.; Mackey, H. E.,Jr.; Christensen, E. J.; Sharitz, R. R.
PHOTOGRAMM. ENG. REMOTE SENS, vol. 53, no. 5, pp. 521-529, 1987.

Abstract: Non-tidal wetlands in a portion of the Savannah River swamp forest affected by reactor cooling water discharges were mapped using 31 March 1981 and 29 April 1985 high-resolution aircraft multispectral scanner (MSS) data. Due to the inherent distortion in the aircraft MSS data and the complex spectral characteristics of the wetland vegetation, it was necessary to implement several innovative techniques in the registration and classification of the MSS data of the Pen Branch Delta on each date. In particular, it was necessary to use a piecewise-linear registration process over relatively small regions to perform image-to-image registration. When performing unsupervised classification, an iterative "cluster busting" technique was used which simplified the cluster labeling process. These procedures allowed important wetland vegetation categories to be identified on each date.

Management and analysis of estuarine data using SAS. 10. National Conference. Estuarine and Coastal Management: Tools of the Trade New Orleans, LA (USA) 12-15 Oct 1986.
Oglesby, J. L.; Mowery, P. D.; Bundrick, C. M., pp. 439-444, 1987.

Abstract: The Statistical Analysis System (SAS) is a computer program for managing and statistically analyzing data. SAS was developed in the early 1970's in response to the growing need for an integrated computer package that could carry out statistical computations as well as manipulate large or complicated data sets. This paper discusses many of the SAS tools currently being used for managing and analyzing the estuarine data base now under development by the U.S. Environmental Protection Agency's National Estuary Program.

Hurricane Preparedness. NTIS Tech Note.
Washington, D.C.: National Oceanic and Atmospheric Administration, Oct 1987. NTIS #: NTN871028XSP

Abstract: This citation summarizes a one-page announcement of technology available for utilization. A search of holdings in the National Sea Grant Depository at the University of Rhode Island shows that 56 hurricane-related publications have been produced by Sea Grant programs. These publications are useful to a variety of users, especially those responsible for community preparedness, and cover a wide range of topics including the following: Awareness and education, Boaters checklist and planning, Construction of resistant homes, Damage assessment, Economic effects, Erosion of beach and dunes, Evacuation planning and difficulties, Flooding extent, Forecasting of wind and waves, Management plans, Message enhancement, Relocation planning, Response to warnings, Risk and geographic location, Shelter evaluation, Social impact, Surge prediction, Watches and warnings, Wave spectra and values.

Predicting the impact of sea level rise on coastal systems. 10. Natl. Conf. Estuar. and Coast. Management: Tools of the Trade New. Orleans, LA (USA) 12-15 Oct 1986.
Park, R. A.; Armentano, T. V.; Cloonan, C. L., 258p., 1987.

Abstract: SLAMM (Sea Level Affecting Marshes Model) was developed to predict changes in coastal areas as a result of rising sea level (brought about by global warming trends due to the greenhouse effect). SLAMM is implemented in Pascal for the IBM PC and compatible microcomputers. Data on elevation, residential and commercial development, distribution of existing levees and other protective structures, and classification according to 16 coastal categories were collected on a square-kilometer grid for 57 representative sites in the contiguous United States these sites included 485,000 hectares of wetlands.

Transport and Diffusion Climatology of the US Atlantic and Gulf Coasts. Conference on coastal meteorology, Los Angeles, CA, USA, 30 Jan 1980. Raynor, G. S.; Hayes, J. V., Brookhaven Natl. Lab., Upton NY, 4p, 1980.
NTIS #: BNL-26891

Abstract: This study is part of a larger study of coastal meteorology and diffusion and was planned to assist in site selection of energy facilities by describing the transport and diffusion climatology of the United States east and Gulf coasts in as much detail as can be extracted from readily available meteorological data. The area covered in this study is the United States east and Gulf coasts from Maine to Texas. The region studied is all within the coastal plain and is generally characterized by flat beaches and very gentle slopes inland except in New England, where the coast is more rugged and the terrain hilly close to the sea. Meteorological variables of primary concern in this study are those which govern or influence transport and diffusion of airborne gases and particles. The most important are wind direction and speed and some measure of diffusive capacity such as turbulence, gustiness or lapse rate. Eight stations were chosen to give four pairs for comparison between a coastal station and another somewhat farther inland. The pairs are Boston and Bedford, Massachusetts; Belmar and Lakehurst, New Jersey; Cape Kennedy and Orlando, Florida; and Galveston and Houston, Texas. The same years of data were obtained for both stations in each pair. Results of selected examples are presented. The frequency of calms and of winds in the three sectors relative to the coastline is reported for the 25 coastal stations from Portland, Maine (PWM) to Brownsville, Texas (BRO). Differences between day and night in wind direction distribution are shown for six selected stations. The frequency of the five diffusion rating classes at the same coastal stations during onshore winds is also shown. Differences in dffusion conditions between day and night at six selected stations are given. The results obtained were arranged for easy use with diffusion models in which the primary meteorological inputs are wind speed and measures of lateral and vertical diffusion. (ERA citation 05:016429).

The Encyclopedia of beaches and coastal environments.
Schwartz, Maurice L.
Stroudsburg, PA: Hutchinson Ross Pub. Co., 940p., 1982.

User's guide to the littoral environment observation retrieval system. Final Report.
Sherlock, A. R.; Szuwalski, A.
Vicksburg, MS: Coastal Engineering Research Center, 40p., 1987.
NTIS #: ADA1816727XSP

Abstract: The lack of available data on waves, currents, and sand movement along beaches in the United States is a major problem confronting planners and designers of coastal projects. Data from instruments such as wave and current gages are expensive to obtain and are rarely available at the precise location where needed. The Littoral Environment Observation (LEO) program was established to help overcome some of these problems. Under this program, volunteer observers are recruited to obtain daily visual observations of such observations of such coastal variables as breaker height, wave period, direction of wave approach, wind speed and direction, longshore current velocity, and beach slope. Observers obtain the data by using simple, inexpensive equipment and for some data, e.g., wave height and direction, observers are asked to simply record a visual estimate. The LEO program has been ongoing since 1968, and observations have been made at over 200 sites along the coasts of the United States. This information collected has been placed in a computer data base and is available to the coastal community. This guide describes the LEO data collection process, the parameters involved, and the use of the LEO Retrieval System. The LEO Retrieval System is a computer-based analysis system that performs a variety of data retrieval, data analysis, and report processing functions.

Marshes of the ocean shore.
Siry, J. V.
College Station, TX: Texas A&M University Press, 216p., 1984.

Potential Effects of Global Climate Change on the United States. Volume 2. National Studies. Draft Report to the Congress, Coastal Engineering Studies in Support of Virginia Beach, Virginia, Beach Erosion Control and Hurricane Protection Project. Report 2. Seawall Overtopping Evaluation Technical rept.
Smith, J. B.; Tirpak, D. A.; Pope, W. J.; Abel, C. E.
Environmental Protection Agency, Washington, DC. Office of Research and Development; Coastal Engineering Research Center, Vicksburg, MS CERC-TR-88-1-2, 65 p., Sep. 1988.

Abstract: National studies: Water resources, Sea level rise, Agriculture, Forests, Biological diversity, Air quality, Human health, Urban infrastructure, Electricity demand, Research needs. 12/3,AN,RN,AB/2 A study was conducted to determine overtopping rates for a step-faced seawall with curved parapet. The seawall was designed as part of a beach erosion control and hurricane protection project along approximately 6 miles of Virginia Beach, Virginia. Storm damages to the area have included loss of beach, destruction of bulkhead and seawall systems, damage to buildings, and inshore flooding along the commercially developed and urban shoreline. Using the Store Time-History Method developed for this study to calculate overtopping rates from results of physical model tests, results show that the design will reduce overtopping to a suitable level. The seawall design consists of a seawall with crest elevation of +15.7 ft NGVD fronted by a beach with elevation +3.4 ft NGVD which was testing using storm surge hydrographs from an August 1933 hurricane and a March 1962 extratropical storm.

The way of the coast. (erosion questions and issues).
Strickland, Richard
Oceans, Vol. 20, pp. 8-17, March-April, 1987.

Bibliography of publications prior to July 1983 of the Coastal Engineering Research Center and the Beach Erosion Board. Final Report.
Szuwalski, A.; Wagner, S.
Vicksburg, MS: Coastal Engineering Research Center, 346p., March 1984.
NTIS #: ADA145404OXSP

Abstract: This bibliography supersedes the Bibliography of Publications of the Coastal Engineering Research Center and Beach Erosion Board by Andre Szuwalski and Linda Clark, dated December 1981. It is a listing of publications issued by the Coastal Engineering Research Center (CERC) and its predecessor, the Beach Erosion Board, before 1 July 1983, when CERC became part of the U.S. Army Engineer Waterways Experimental Station. All CERC publications issued after that date are listed in the List of Publications of the U.S. Army Engineer Waterways Experiment Station.

The case of the vanishing beaches. (United States seashore).
Taylor, Ronald A.
U.S. News & World Report, Vol. 102, p. 33, June 22, 1987.

Defending our shores; about face for the Army Corps of Engineers?
Thompson, Roger
Oceans, Vol. 20, pp. 34-41, March-April, 1987.

Wetlands of the United States: current status and recent trends.
Tiner, Ralph W., Jr.
Washington, D.C.: U.S. Dept. of the Interior, National Wetlands Inventory, Fish and Wildlife Service, 59p., 1984.
For sale by GPO.

III. Living resources

1985 National Shellfish Register of Classified Estuarine Waters. Washington, D.C.: U.S. HHS, FDA; NOAA, NMFS, NOS, Dec. 1985.

Pattern and persistence of a nearshore planktonic ecosystem off Southern California.
Barnett, A. M.; Jahn, A. E.
CONT. SHELF RES, vol. 7, no. 1, pp. 1-25, 1987.

Abstract: Three related data sets from a baseline environmental survey on the continental shelf at San Onofre, California, consisting of: (1) zooplankton pumped from discrete depths on transects between the 8- and 30-m contours, sampled from 1976 to 1980 (2) zooplankton from oblique net hauls on a transect from 8 to 100 m sampled at 2-week intervals for 1 y, 1978-1979 and (3) vertical profiles of temperature, nutrients and plant pigments corresponding closely in time and space to the oblique net hauls, are used to describe cross-shelf zooplankton abundance patterns, community composition, and seasonal and shorter-term variations in cross-shelf zonation and their relation to variations in physical and chemical measures. Throughout the year, nearshore and offshore assemblages were

distinguishable, the change occurring at about the 30-m contour.

Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates.
Beauchamp, D. A.; Shepard, M. F.; Pauley, G. B.
Vicksburg, MS: Armly Engineer Waterways Experiment Station, 43p., Oct. 1983. NTIS #: ADA1472638XSP

Abstract: Species profiles are summaries of the life histories and environmental requirements of selected coastal fishes and invertebrates of commercial, recreational, or ecological significance. The Profiles will be used to relate life history and environmental requirements of species to coastal numerical water quality models and to assist in evaluating the environmental impacts of altering estuarine habitats. The data for the preparation of Species Profiles are taken from the published and unpublished literature.

Utilizing Remote Sensing of Thematic Mapper Data to Improve Our Understanding of Estuarine Processes and Their Influence on the Productivity of Estuarine-Dependent Fisheries. Semiannual Progress Report No. 5.
Browder, J. A. ; May, L. N.; Rosenthal, A.; Baumann, R. H.; Gosselink, J. G.,
National Oceanic and Atmospheric Administration, NMFS, SEFC, 51p., 10 June 1988. NTIS #: N89-13822/6/XAB

Abstract: The continuing disintegration of the coastal marshes of Louisiana is one of the major environmental problems of the nation. The problem of marsh loss in Louisiana is relevant to fishery management because Louisiana leads the nation in landings of fishery products, and most of the landed species are dependent upon estuaries and their associated tidal marshes. In evaluating the potential effect of marshland loss on fisheries, the first two critical factors to consider are: whether land-water interface in actual disintegrating marshes is currently increasing or decreasing, and the magnitude of the change. In the present study, LANDSAT Thematic Mapper (TM) data covering specific marshes in coastal Louisiana were used to test conclusions from the Browder et al (1984) model with regard to the stage in disintegration at which maximum interface occurs; to further explore the relationship between maximum interface and the pattern of distribution of land and water suggested by the model; and to determine the direction and degree of change in land-water interface in relation to land loss in actual marshes.

Temperature-Oxygen Habitat for Freshwater and Coastal Striped Bass in a Changing Climate. American Fisheries Society meeting, Toronto, Canada, 12 Sep 1988..
Coutant, C. C. Oak Ridge National Lab., 39p, 1988.
NTIS #: DE89005125/XAB

Abstract: Habitat space for a fish species is normally constrained by extreme temperatures and low dissolved oxygen concentrations that the fish avoid. Both latitudinal limits to a species' distribution over a large area and availability of suitable habitat on the local scale may be altered by climate change. Average temperatures are expected to rise globally, and rainfall is expected to decrease in middle and increase in high latitudes in the next century. This paper uses the anadromous and landlocked stocks of striped bass to illustrate the possible effects of climate change on fish distribution. The tenuous existence of striped bass along the northern coast of the Gulf of Mexico and in Florida will likely be jeopardized by regional warming and reduced streamflow in the rivers in which these fish reside. In many freshwater lakes, reservoirs, and estuaries, the existing summer constriction of suitable habitat by high temperatures and low oxygen concentrations may be aggravated by warming, altered streamflow, and increased hypoxia. An expansion of the species' range around Nova Scotia and in the Gulf of St. Lawrence may occur, although the cold Labrador Current may strengthen and cancel any potential water temperature increases. Our understanding of the habitat requirements of highly visible fish species exceeds our confidence in climate models, but will allow forecasts of changes in regional and local habitat suitability as climate understanding and forecasting improve. 45 refs., 7 figs.

Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (Mid-Atlantic).
Fay, C. W.; Neves, R. J.; Pardue, G. B.
Vicksburg, MS: Army Engineer Waterways Experiment Station, 181 p., 1983. NTIS #: ADA1477728XSP

Abstract: Species Profiles are summaries for the life histories and environmental requirements of selected coastal fishes and invertebrates of commercial, recreational, or ecological significance. This series covers Mid-Atlantic - Cape Cod to Cape Hatteras, North Carolina. Forty species or species groups were selected in order of priority by offices of the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service for each biogeographic region.

Long-term changes in coastal benthic communities.
Heip, C.;Keegan, B. F.; Lewis, J. R.
Dordrecht [Netherlands]; Boston: Junk, 339p., 1987.

Chesapeake Bay Environmental Data Directory.
Jacobs, D.; Haberman, D.; Smith, D.; Swartz, D.; Sigel, E.; Adams, M. National Oceanic and Atmospheric Administration; VA Sea Grant; MD Sea Grant.
College Park, MD: Maryland Sea Grant Program, ca. 1000p., 1987.

Habitat suitability index models: Red king crab.
Jewett, S. C.; Onuf, C. P.
Alaska Univ., Fairbanks, Alaska Coop. Fish. Res. Unit; Natl. Wetlands Research Center, Slidell, LA, p. 44, March 1988.

Abstract: A review and synthesis of existing information were used to develop models for evaluating habitat of different life stages of red king crab. The model is scaled to produce an index between 0 (unsuitable habitat) and 1 (optimal habitat) in Alaskan coastal waters, especially in the Gulf of Alaska and the southeastern Bering Sea. Habitat suitability models are designed for use with the Habitat Evaluation Procedures previously developed by the US Fish and Wildlife Service. Guidelines for model application and techniques for measuring model variables are provided. 94 refs., 1 fig., 7 tabs.

A Coastal Marine Ecosystem; Simulation and Analysis
Kremer, J. N.; Nixon, S. W.
New York: Springer-Verlag, 217p., 1978.

Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (Gulf of Mexico).
Lassuy, D. R.; Muncy, R. J.; Wingo, W. M.; Robinette, H. R.
Vicksburg, MS: Army Engineer Waterways Experiment Station, 103p., 1984.
NTIS #: ADA147771OXSP

A bioeconomic simulation of the Alaskan king crab industry.
Matulich, S. C.; Hanson, J. E.; Mittelhammer, R. C.
National Oceanic and Atmospheric Administration.
Seattle, WA: NOAA, NMFS, 101p., Dec. 1988.

Protection of natural resources through environmental indices.
O'Connor, J. S.; Pugh, W. L.; Wolfe, D. A.; Dewling, R. T.
SEA TECHNOL, vol. 27, no. 9, pp. 31-33, 1986.

Abstract: While many available indicators are useful in pollution assessment, simple indices are often most advantageous from the decision-maker's perspective. Governments have long used indices of their economic conditions. For many of the same reasons, including the need to understand influences of environmental quality on economics, indices of marine envrionmental quality are expected to be developed and used in the near future. Indices, unlike the direct measurements on which they are based, include some technical interpretation, and this important benefit is transmitted to the layman and the general public. Indices, therefore, can be tangible and readily interpreted without reference to additional standards or reference values. Direct measures alone of most environmental features are marginally interpretable in the managerial context. Improved indices of pollutant degradation are needed as guides to design monitoring programs. It is evident that major collaborative efforts would be necessary to monitor effectively on a national basis, just to coordinate monitoring for compliance with existing laws and regulations which monitor for trends in contamination and fate and effects.

West Coast Fisheries Economic Assessment Model; Final Report and Computer Spreadsheet Program: A Comprehensive Analytical Program for Use with SuperCalc 3. Final rept.
Radke, H.; Jensen, W.
West Coast Fisheries Development Found., 71p., Sep. 1986.
NTIS #: PB89-184899/XAB

Abstract: The report covers Year Two of a project to develop a West Coast fisheries economic evaluation model to determine the economic impact of current seafood landings upon harvestors, processors, fishing communities and states, and to provide forecasts of the impact of management decisions and changing natural phenomena upon these same sectors. The report provides details of the model which has reached a point of development where it can, with the currently available data sheets and input/output coefficients, provide computer assessments.

Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (South Atlantic).
Rogers, S. G.; van den Avyle, M. J.; Fowler, D. L.
Vicksburg, MS: Army Engineer Waterways Experiment Station, 98p., 1984.
NTIS #: ADA1477744XSP

Abstract: Species profiles are summaries of the life histories and environmental requirements of selected coastal fishes and invertebrates of commercial, recreational, or ecological significance. This series covers South Atlantic-Cape Hatteras to Cape Canaveral, Florida. Forty species or species groups were selected order of priority by offices of the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service for each biogeographic region.

Species profiles: Life histories and environmental requirements of coastal fishes and invertebrates (Pacific Southwest).
Vicksburg, MS: Army Engineer Waterways Experiment Station; U.S. Fish & Wildlife Service, 21p., 1984.
NTIS #: ADA1477736XSP

Abstract: Species Profiles are summaries for the life histories and environmental requirements of selected coastal fishes and invertebrates of commercial, recreational, or ecological significance. This series covers Pacific Southwest - U.S.-Mexico border to Cape Mendocino, California. Forty species or species groups were selected in order of priority by offices of the U.S. Army Corps of Engineers and the U.S. Fish and Wildlife Service for each biogeographic region.

Edge of the sea.
Sackett, Russell
Alexandria, VA: Time-Life Books, 176p., 1983.

Index Numbers and Productivity Measurement in Multispecies Fisheries: An Application to the Pacific Coast Trawl Fleet. Technical rept.
Squires, D.
Seattle, WA: NOAA, NMFS, 42p., July 1988.
NTIS #: PB89-108211/XAB

Abstract: The study is concerned with the measurement of total factor productivity in the marine fishing industries in general and in the Pacific coast trawl fishery in particular. The study is divided into two parts. Part I contains suitable empirical and introductory theoretical material for the examination of productivity in the Pacific coast trawl fleet. It is self-contained, and contains the basic formulae, empirical results, and discussion. Part II draws together the theoretical literature into one place to allow ready access for readers interested in more details. The major methodological focus of the study is upon the type of economic index number that is most appropriate for use by economists with the National Marine Fisheries Service.

Species Profiles: Life Histories and Environmental Requirements of Coastal Fishes and Invertebrates (North Atlantic).
Stanley, J. G.; Dewitt, R.; Danie, D. S.
Vicksburg, MS: Army Engineer Waterways Experiment Station, 69p., 1983
NTIS #: ADA1477694XSP

Some results of a joint oceanographic-remote sensing program in the Chesapeake Bay plume. 6. Biennial International Estuarine Research Conference Gleneden Beach, OR (USA) 1-5 Nov 1981.
Thomas, J. P.; Robertson, C. N.
ESTUARIES, vol. 4, no. 3, pp. 302-303, 1981.

Abstract: A joint oceanographic-remote sensing program was developed between the NOAA Northeast Fisheries Center and the NASA Langley Research Center with academic involvement for the purpose of 1) hastening the development of remote sensing for use as a long-range monitoring "tool" to assess the quality of our estuarine and coastal waters and 2) determining the influence of estuarine plumes ("outwellings") on the living marine resources of the contiguous continental shelf. By way of expansion, contraction, changes in direction, and the fractionation of materials the Chesapeake Bay plume exerts a greater or lesser, positive or negative influence on the living marine resources of the contiguous shelf.

Fishery regulation: Its use under the Magnuson Act and Reaganomics.
Turgeon, D. D.
MAR. POLICY, Vol. 9, No. 2, pp. 126-133, 1985.

Abstract: This article discusses the prevailing federal administrative atmosphere within which marine fisheries regulations work, and describes how the National Marine Fisheries Service has responded to the requirements and constraints of regulations for preliminary management plans and fishery management plans. Furthermore it explores alternatives to regulations and considers the future direction of fishery regulation.

Marine Ecosystem Modeling - Proceedings from a Workshop held April 6-8, 1982, Frederick, MD.
Turgeon, Kenneth W.
Washington, D.C.: NOAA, NESDIS, 271p., Aug. 1983. NTIS #: PB84100429XSP

Abstract: The report describes the workshop, held on April 6-8, 1982 in Frederick, Maryland. The major objective of this workshop was to bring together research scientists, model builders, model users, resource economists, resouce managers, and administrators to discuss and assess the current and future role of ecosystem modeling as a useful and practical tool in marine environmental impact assessment and in the development and implementation of management strategies and policies for conservation and wise utilization of marine resources.

Long-term biological data sets: Their role in research, monitoring, and management of estuarine and coastal marine systems.
Wolfe, D. A.; Champ, M. A.; Flemer, D. A.; Mearns, J. A.
ESTUARIES, vol. 10, no. 3, pp. 181-193, 1987.

Abstract: Long-term records of biological data are extremely valuable for documenting ecosystem changes, for differentiating natural changes from those caused by humans, and for generating and analyzing testable hypotheses. Long-term sampling, however, is generally discouraged by a variety of institutional disincentives, so that today such records are uncommon. The authors discuss approaches for overcoming these disincentives through improved research planning and design, including clearer a priori definition of management and regulatory actions and information needs, more rigorous adherence to hypothesis formulation and testing, and proper spatial and temporal scaling in sampling.

IV. Pollution

Cleaning up the Chesapeake: a cooperative effort takes shape.
Adams, C.
Sierra (United States) Vol. 69, No. 4, pp. 14-18, Jul-Aug 1984.

Abstract: A decline in the water quality of Chesapeake Bay prompted Congress to appropriate money for an Environmental Protection Agency study of the Bay's ecological problems. An early finding was the discovery that contaminants entering the Chesapeake, whether nutrients or toxic chemicals, are not flushed out to the Atlantic but remain in the estuary, joining the food chain or accumulating in the bottom sediments. The Program also identified a serious toxic-chemical and metal-contamination problem in the industrialized areas. Sediments showed high concentrations of chemicals such as PCBs, Kepone, and DDT. Metals (including cadmium, chromium, lead, and zinc) appeared to be deposited in the slow-moving estuarine waters by the bay's tributary river systems. The overall picture was that of a declining ecosystem. The final phase of the Chesapeake Bay Program has involved initiation of a concerted management effort to restore the Chesapeake to its historical productivity. The EPA study was unique in its creation of a partnership among the governing agencies involved in the issue. The Sierra Club and other environmental organizations have supported the extension and expansion of the Clean Water Act which would provide the statutory base for a federal Chesapeake Bay program.|;.

The National Coastal Pollutant Discharge Inventory.
Basta, D. J.; Bower, B. T.; Ehler, C. N.; Arnold, F. D.; Chambers, B. P.; Farrow, D. R. G.
Rockville, MD: NOAA, NOS, Strategic Assessment Branch, 18p., July 1985.

Research strategy for ocean disposal: Conceptual framework and case study: Environmental hazard assessment of effluents.
Bierman, V. J., Jr.; Gentile, J. H.; Paul, J. F.; Miller, D. C.; Brungs, W. A.; Bergman, H. L.; Kimerle, R. A.; Maki, A. W.
U.S. EPA Environmental Research Lab., Narragansett, RI
Workshop on hazard assessment for complex effluents held at Valley Ranch, WY, USA 22 Aug. 1982
Elmsford, NY: Pergamon Books Inc., pp. 313-329, 1986.
NTIS #: CONF-8208149-

Abstract: The safe disposal of wastes, whether of industrial or municipal origin, is the ultimate concern of effective waste management. In the past, wastes are disposed of on land, incinerated, released to aquatic systems, or recycled and reused. Wastes presently dumped directly into U.S. marine waters are conservatively estimated to exceed 50 million tons per year. Of this amount, approximately 80% consists of dredged materials, 10% consists of industrial wastes, 9% consists of sewage sludge, and the remaining 1% consists of miscellaneous wastes. The total quantity of these wastes is increasing sharply as a result of rising coastal populations and requirements for higher levels of treatment for municipal and industrial wastes. Because land disposal has become more difficult and costly to

implement, the issue of increased use of coastal and ocean waters for waste disposal is being reappraised. The Marine Protection, Research and Sanctuaries Act (MPRSA) of 1972, commonly referred to as the ''Ocean Dumping Act,'' is the principal statute that governs waste dumping in the ocean, seaward of the 3-mile boundary (baseline) of the territorial sea. The purpose of this paper is to propose a research strategy for ocean disposal. This strategy supports a decision rationale that is based on a predictive hazard assessment approach. The conceptual framework for the strategy is outlined, and its major components are identified and discussed. The implementation of this strategy is then discussed within the context of an actual case study.

Oceanic processes in marine pollution. Vol. 1. Biological processes and wastes in the ocean.
Capuzzo, J. M.; Kester, D. R.
Malabar, FL: Krieger, 265p., 1987.

Ocean Dumping of Seafood Wastes in the United States.
Champ, M. A.; O'Connor, T. P.; Park, P. K.
MAR. POLLUT. BULL, Vol. 12, No. 7, pp. 241-244, 1981.

Abstract: In the United States fish wastes can be ocean dumped without an Ocean Dumping Permit if the wastes contain no additives (flocculating or preserving agents, etc.). Fish wastes are currently ocean dumped off A merican Samoa, Louisiana and Puerto Rico. Fish wastes are characteristically high in proteins, fats, dissolved and suspended organic materi als. Water quality parameters affected by these wastes are biochemical oxygen demand, oil and grease, pH, and turbidity. Other key factors included organic and nutrient enrichment, the attractant of undesirable predator species (i.e. sharks) and the natural oxygen regeneration processes.

Hazardous waste incineration at sea: EPA decision making on risk.
Ditz, D. W.
Risk Anal. (United States), Vol. 8, No. 4, pp. 499-508, Dec. 1988.

Abstract: This paper critiques the Environmental Protection Agency's assessment of risk for hazardous waste incineration at sea. It reviews operational and transportation risks and considers alternative approaches for managing chlorinated organic hazardous wastes. It concludes that depending on the scale of the program, ocean incineration will either contribute little to the overall management of this waste stream or else it will engender significant risks, especially in the coastal environment. Furthermore, past assessments on the part of EPA have tended to understate the risks of incineration at sea while simultaneously holding out the promise of the technology as a commercial-scale management option. Finally, this paper observes that the Western European countries that pioneered incineration in the North Sea are now finding practical alternatives. It is recommended that waste reuse, on-site treatment, and techniques of waste reduction provide viable alternatives and obviate the need for incineration at sea.

Land Use and the Nation's Estuaries. (National Estuarine Inventory)
Donovan, M. L.; Tolson, J. P.
National Oceanic and Atmospheric Administration.
Rockville, MD: NOAA, NOS, Strategic Assessment Branch, 11p., March 1987.

Scales of biological effects.
Duedall, I. W.; O'Connor, T. P.; Norton, M. G.; Mearns, A. J.; Wolfe, D. A.
National Oceanic and Atmospheric Administration.
Rockville, MD: NOAA, Ocean Assessments Division, pp. 2-10, 1987.

Abstract: As an introduction to subsequent chapters on physical and chemical factors controlling the distributions of contaminants in the ocean, the authors reviewed data on the scales over which biological effects have been shown or strongly suggested to have been induced by waste inputs. These scales of biological impact provide insights on scales that are appropriate for physical modelling of distributions for different categories of contaminants. Observed effects extend up to 10 super(5) km super(2) (for hypoxia), but most known effects have been much more localized, a fact that emphasizes the importance of small-scale models in predicting the effects of waste inputs.

Coal ports and environmental considerations. Symposium on coal ports and environmental considerations, Seattle, WA, 4 June 1982.
Kooser, J. C.; Dyer, P.
Seattle, WA: Institute for Environmental Studies, 288p., 1983.
NTIS #: COMF-8206329

Abstract: The following papers were presented: existing and potential West Coast coal ports; Asian demand; how coal is marketed; visualizing a Puget Sound coal terminal; are any more coal ports needed; West Coast coal port development; railroads; slurry pipelines; water transport/safety; air quality impacts of coal terminal operations: actual problems; engineering solution to fugitive dust emissions at coal terminals; water quality problems of coal port construction and operation; port operations: water quality and quantity; National Environmental Policy Act - yesterday, today, and tomorrow; master planning a port to accommodate coal facilities; human environment: secondary impacts; land uses outside the coastal zone - what are they.; coastal zone management: laws permits, regulations; shoreline and estuarine management; potential environment problems and solutions; job opportunities and their impact on the United States; can an environmentally conscientious coal port be achieved - what is required; a Great Lake port and Western coal. Some papers have been abstracted separately.

Mussel Watch--Measurements of Chemical Pollutants in Bivalves as One Indicator of Coastal Environmental Quality.
Farrington, J. W. ; Davis, A. C.; Tripp, B. W.; Phelps, D. K.; Galloway, W. B.
New Approaches to Monitoring Aquatic Ecosystems, ASTM STP 940, pp.125-139, 1987.

Abstract: The utility of the bivalve sentinel organism approach to monitoring for some chemicals of environmental concern in coastal and estuarine areas has been evaluated by regional and national programs and by smaller scale research efforts during the past 15 years. The extent and severity of coastal contamination by chemicals such as polychlorinated biphenyls, chlorinated pesticides, trace metals, and plutonium has been assessed in several bivalve sentinel organism programs. Advantages and limitations of this approach are presented and discussed briefly within the context of both national and international efforts. (Copyright (c) American Society for Testing and Materials, 1987.).

Oceans '87. The Ocean "an international workplace." Proceedings, Vol. 5, Coastal and Estuarine Pollution. Halifax, Nova Scotia, Canada, September 28-October 1, 1987. Sponsored by the Marine Technology Society and IEEE.
Washington, D.C.: The Institute of Electrical and Electronics Engineers; Marine Technology Society, 1987.

The International Mussel Watch.
Natural Resource Council, Washington, D. C., 265p, May 1980.
NTIS #: PB81-114878

Abstract: The report provides a 'state-of-the-art' evaluation of the use of bivalves in marine monitoring. Its primary audience will be those investigators concerned with costal zone management, but it will also be of value to researchers in international programs examining near-costal pollution and effects of ocean dumping.

Estuaries and coastal waters need help.
Levenson, H.
Office of Technology Assessment, Washington, D. C.
Environ. Sci. Technol. (United States), Vol. 21, No. 11, pp. 1052-1054, Nov. 1987.

Abstract: For years, our marine environments - estuaries, coastal waters, and the open ocean - have been used extensively by coastal communities and industries for the disposal of various wastes. Historically, marine waste disposal has been relatively cheap and has solved some short-term waste-management problems; however, its consequences include a general trend toward environmental degradation, particularly in estuaries and coastal waters. Thus, without protective measures, the next few decades will witness degradation in many estuaries and some coastal waters around the country. The extent of current degradation varies greatly around the country. Although it is difficult to ascertain cause and effect relationships, enough evidence exists to conclude that the pollutants in question include disease-causing microorganisms, oxygen-demanding substances, partuculate material, metals, and organic chemicals. Two statutes form the basis of most federal regulatory efforts to combat marine pollution; the Marine Protection, Research, and Sanctuaries Act (MPRSA) and the Clean Water Act (CWA). The MPRSA regulates the dumping of wastes in coastal and open-ocean waters, whereas the CWA has jurisdiction over pipeline discharges in all marine waters, wastes dumped in estuaries, and runoff. Many people consider that the passage and implementation of these two acts and their ensuing amendments established a statutory structure sufficient to protect the nation's waters from pollution. However, these provisions have not protected some estuaries and coastal waters from degradation.

The sludge factor. (law to end ocean dumping of sewage sludge will not make New Jersey beaches any cleaner).
Marshall, Eliot
Science, Vol. 242, pp. 507-509, Oct. 28 1988.

Biological effects versus pollutant inputs: The scale of things.
Mearns, A. J.; O'Connor, T. P.
TECH. REP. MD. UNIV. SEA GRANT PROGRAM, pp. 693-724, 1984.

Abstract: Environmental decision-makers need to know something about the "significance," or importance, of measured effects of marine pollution. Too often, however, evaluation of significance is not offered or, if it is, it is in a form so alien that it is frequently over-looked. There always will be justifiable debate about the meaning of any scientific measurement. However, there is one measure of marine pollution that at least lends itself to constructive debate and decision-making. That is the scale of damage caused by polluting activity. The questions are these: Are we not able to measure the areal extent of biological effects and, further, are we able to predict how the extent of the damage will change as a result of various remedial or disposal actions?

The on-scene spill model.
Torgrimson, G. M.
National Oceanic and Atmospheric Administration.
Rockville, MD: NOAA, NOS, OMA, vp., 1984.

Oceanic processes in marine pollution. Volume 2. Physicochemical processes and wastes in the ocean.
O'Connor, T. P.; Burt, W. V.; Duedall, I. W.
Malabar, FL: Krieger, 235 p., 1987.

Abstract: This second volume, one of six in the set, emphasizes physical and chemical processes associated with wastes disposed of in the ocean. This book also examines vertical transport of wastes and the role of marine organisms in the transport of waste materials.

A strategy for monitoring of contaminant distributions resulting from proposed sewage sludge disposal at the 106-Mile Ocean Disposal Site.
O'Connor, T. P.; Walker, H. A.; Paul, J. F.; Bierman, V. J.,Jr. MAR. ENVIRON. RES, Vol. 16, No. 2, pp. 127-150, 1985.

Abstract: It has been proposed that future ocean disposal of sewage sludge from the US east coast be done at a site beyond the edge of the continental shelf. In anticipation of that, a monitoring strategy has been developed to determine the average spatial distribution of contamination. The strategy is an iterative series of measurements developed from models of sludge dispersion and settling which are based on characteristics of the disposal site and sewage sludge. Once disposal is initiated at the site, the strategy requires sampling the upper mixed layer at 36 stations, mostly within 100 km of the site, and deployment of near-bottom sediment traps along a line extending 300 km away from the site. Based on initial results, subsequent sampling locations will be selected to refine estimates of the detectable extent of sludge-derived contamination.

Wastes in marine environments.
Office of Technology Assessment Task Force.
Washington, D.C.: Congress of the U.S., Office of Technology Assessment, 320p., 1987. NTIS #: PB87-194585/AS

Abstract: Examines the different technologies used or proposed for disposal of different types of waste in the ocean such as sewage sludge, dredged material, low and high-level radioactive waste, and some industrial wastes.

Agricultural Pesticide Use in Estuarine Drainage Areas: A Preliminary Summary for Selected Pesticides.

Pait, A. S.; Farrow, D. R. G.; Lowe, J. A.; Pacheco, P. A.
National Oceanic and Atmospheric Administration.
Rockville, MD: NOAA, NOS, Strategic Assessments Branch, 134p., Jan. 1989.

Report to the Congress on ocean pollution, monitoring and research, October 1986 through September 1987. (Submitted in compliance with Sections 201 and 202, Title II of the Marine Protection, Research, and Sanctuaries Act of 1972 (Public Law 92-532)
Washington, D.C.: U. S. Dept. of Commerce, National Oceanic and Atmospheric Administration, National Ocean Service, 73p., June 1988.

The National Marine Pollution Research, Development and Monitoring Program.
Robertson, A.
Sea Technology, Vol. 24, No. 10, pp. 17-24, 1983.

Abstract: Before the major upsurge in environmental awareness during the 1960s, the federal government had relatively little involvement with research and monitoring related to marine pollution issues. However, during the 60s and 70s the public demanded more efforts directed at assessing the status of, and protecting, our environment, including the marine areas around coasts. By the late 70s Congress was faced with a confusing mass of such programs and was concerned that these efforts were often uncoordinated or overlapping. In an atttempt to remedy this situation, Congress passed the National Ocean Pollution Planning Act (P.L. 95-273) in May of 1978. The Act directs the national Oceanic and Atmospheric Administration (NOAA) to develop a comprehensive five-year plan for federal ocean (including Great Lakes) pollution research, development, and monitoring programs and to update this plan. This paper uses the latest version of the summary which describes programs conducted during federal fiscal year 1982 (FY 82). Overall federal effort did not change singificantly between FY 82 and FY 83.

Emphasis and trends in federally funded pollution research and monitoring programs for the Great Lakes. 28th. Conference on Great Lakes Research Milwaukee, WI (USA) 3-5 Jun 1985.
Robertson, A.; Monaco, M. E., 61p., 1985.

Abstract: Among its provisions, the National Ocean Pollution Planning Act directs NOAA to document the federally funded research, development, and monitoring programs related to marine and Great Lakes pollution. This paper presents a summary of the Great Lakes part of this documentation. In FY 1983 Federal funding for pollution research and monitoring on the Great Lakes totaled approximately $10.4 million. NOAA and EPA provided most of these funds. The funding has been categorized in relation to the various pollutants being studied and to the general types of activities causing the pollution. Waste disposal in the lakes and coastal land use activities around the lakes were the major causes studied, jointly receiving 66% of the funds. The pollutants receiving the most study were synthetic organics, biostimulants, and metals.

Final Environmental Impact Statement for Proposed Oil and Gas Lease Sales 113/115/116, Gulf of Mexico OCS (Outer Continental Shelf) Region.
Rouse, R. M.; Lehman, J. W.; Holt, J.N.
Minerals Management Service, New Orleans, LA. Gulf of Mexico OCS Regional Office MMS/GM/ES-88/001; OCS/EIS/MMS-87/0077, 729p., Oct. 1987.

Abstract: The EIS is a description of the environmental aspects and impacts of oil and gas activities resulting from the lease sale or the states bordering the Gulf of Mexico. It provides a description of the area, affected environment, and environmental consequences; it discusses the proposed action, issues and areas of concern, and the major differences of holding this lease sale.

Estimating the atmospheric input of pollutants into a watershed.
Samson, P. J.
WATER AIR SOIL POLLUT Special issue: Acidification and anadromous fish of Atlantic estuaries. Vol. 35, No. 1-2, pp. 7-17, 1987.

Abstract: Estimating the atmospheric input of ions to a watershed has traditionally been accomplished through either the extrapolation of point measurements of deposition or the integration of model estimated deposition. This paper examines the characteristics of precipitation chemistry on the eastern seaboard of the United States where precipitation quality could conceivably affect fish habitats in estuaries. The measured values presented here have been extracted from the data base of the Utility Acid Precipitation Sampling Program (UAPSP) precipitation chemistry network. These data illustrate the nature of ionic deposition at four points on the eastern seaboard.

Contamination of populated estuaries and adjacent coastal ocean: a global review.
Segar, D. A.; Davis, P. G.(SEAMOcean, Inc.)
National Oceanic and Atmospheric Administration.
Rockville, MD: NOAA, NOS, OMA, 120p., 1984.

TBT in California coastal waters: Monitoring and assessment.
Stallard, M.; Hodge, V.; Goldberg, E. D.
ENVIRON. MONIT. ASSESS, Vol. 9, No. 2, pp. 195-220, 1987.

Abstract: Butyltins were monitored at over eighty sites, primarily marinas, in surface waters and sediments of the California coast. Values of tributyltin (TBT) in marina waters ranged from 20 to 600 ppt while lower values were usually found in harbors and on the coast. The origin of the tributyltin is in its use as an antifouling agent in marine paints. In those marinas where the concentrations are greater than about 100 ppt, there is usually a conspicuous absence of native organisms, especially molluscs, which are among the most sensitive animals to the highly toxic TBT. The impact of TBT upon not-target organisms recalls the DDT episode of the 1970s. Increasing uses of TBT-containing antifouling paints in the future may have even more drastic effects on coastal organisms than those observed today. The conclusion is inescapable that TBT should be banned for use in commercially available marine paints.

Water-quality data for selected stations in the East Everglades, Florida.
Waller, B. G.
Open-File Report. United States Geological Survey. 81-0821, 84p., 1981.

Natural trace metal concentrations in estuarine and coastal marine sediments of the southeastern United States.

Windom, H. L.; Schropp, S. J.; Calder, F. D.; Ryan, J. D.; Smith, R. G.,Jr.; Burney, L. C.; Lewis, F. G.; Rawlinson, C. H.
ENVIRON. SCI. TECHNOL, Vol. 23, No. 3, pp. 314-320, 1989.

Abstract: Over 450 sediment samples from estuarine and coastal marine areas of the southeastern United States remote from contaminant sources were analyzed for trace metals. Although these sediments are compositionally diverse, As, Co, Cr, Cu, Fe, Pb, Mn, Ni, and Zn concentrations covary significantly with aluminum, suggesting that natural aluminosilicate minerals are the dominant natural metal bearing phases. Cd and Hg do not covary with aluminum apparently due to the importance of the contribution of natural organic phases to their concentration in sediments. It is suggested that the covariance of metals with aluminum provides a useful basis for identification and comparison of anthropogenic inputs to southeastern U.S. coastal/estuarine sediments. By use of this approach sediments from the Savannah River, Biscayne Bay, and Pensacola Bay are compared.

Fossil fuels: Transportation and marine pollution.
Wolfe, D. A.
ENVIRON. SCI. TECHNOL, pp. 45-93, 1985.

Abstract: Most of the 1.8 x 10 super(9) metric tons (t) of petroleum transported on the oceans each year is on routes from the Middle East and Africa to the United States, western Europe, and Japan. In 1979 approximately 125 x 10 super(6) t of coal were transported on the oceans by way of principal routes from the eastern United States, Australia, and South Africa to western Europe and Japan. Release of the cargo material into the marine environment may results from either normal operating procedures or accidents. Components of natural gas are highly volatile, have a very short residence time in the sea, and are relatively nontoxic compared to the less-volatile fractions of petroleum. Effects of coal on marine systems are associated primarily with the transient settling of particulate coal through the water column and the subsequent deposition of a coal layer on the seafloor. Some coal hydrocarbons leach into seawater, however, and could add to the cumulative hydrocarbon loading in the ocean from other sources.

Persistent plastics and debris in the ocean: An international problem of ocean disposal. 6. International Ocean Disposal Symposium Pacific Grove, CA (USA) 21-25 Apr 1986.
Wolfe, D. A..
MAR. POLLUT. BULL, Vol. 18, No. 6B, pp. 303-305, 1987.

Abstract: The Sixth International Ocean Disposal Symposium (IODS6), brought together about 160 participants from 10 nations to discuss various aspects of waste disposal and its effects in the oceans. The objective of the symposium series is to provide a forum for the exchange of ideas and information among investigators involved in oceanic disposal research, to enhance the scientific considerations of waste disposal in the marine environment, and to generate recommendations and guidelines for future studies on oceanic disposal practices. A major theme at IODS6 was the at-sea disposal of plastics and other persistent synthetic materials (including fishing nets). Papers have been selected from those presented at the meeting to provide a comprehensive overview of problems related to persistent plastics and debris in the sea, and a representative selection of current research topics in this field.

Strategies for marine environmental quality assessment.
Zirino, A.; Pickwell,G. V.; Henderson, R. S.; Lapota, D.; Johnston, R. K.; Yamamoto, S.; Hightower, J. D.
OCEAN SCI. ENG, Vol. 11, No. 3-4, pp. 137-152, 1987.

Abstract: The organizational and scientific strategies of the Marine Environmental Quality Assessment Program at the U.S. Naval Ocean Systems Center, San Diego are presented. The scientific effort is directed towards determining stress in individual organisms and in community structure produced by non-lethal but chronic exposure to harmful pollutants.